

PATENT ABSTRACTS OF JAPAN

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(71)Applicant : MATSUSHITA ELECTRIC IND CO LTD

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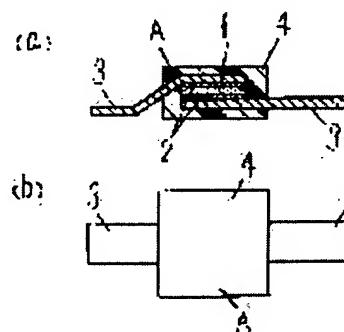
(72)Inventor : IZUMIKAWA TOSHIHIKO
OO FUMIO

(54) PTC DEVICE AND CONSTITUTION BATTERY HAVING PTC DEVICE

(57)Abstract:

PURPOSE: To enhance the heat resistance and thermal shock resistance of a PTC device and to maintain safety and reliance of a battery and a constitution battery using the PTC device for a long term.

CONSTITUTION: In a PTC device A, the surface except for a part from which a metallic lead 3 is taken out is covered with a heat resistant polyparaxylene resin 4. The heat resistance of the PTC device is increased. The reliability and safety of a constitution battery using the PTC device A are enhanced.



LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

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CLAIMS

[Claim(s)]

[Claim 1] PTC equipment characterized by covering the front face with poly PARAKI silylene system resin except for the lead takeoff connection of a metal lead in a metal plate and the PTC equipment which comes to carry out the laminating of the metal lead to vertical both sides of a PTC component.

[Claim 2] The configuration cell equipped with the PTC equipment characterized by connecting between cells the PTC equipment which covered the front face with poly PARAKI silylene system resin except for the lead takeoff connection of a metal lead in a metal plate and the PTC equipment which comes to carry out the laminating of the metal lead to vertical both sides of a PTC component.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the configuration cell equipped with PTC equipment and PTC equipment.

[0002]

[Description of the Prior Art] In the normal state, the PTC equipment which consists of the former by stick by pressure the metal plate which connected the metal lead to the PTC component (POSITIVE TEMPERATURE COEFFICIENT) which be an overcurrent and a heating protection component have the description which return to the original low resistor, when what be the resistor of dozens milli ohms become a dozens of ohms resistor by the unusual energization from the outside, and the temperature rise in the inside of a short time and an external load change into a normal condition. For this reason, as shown in drawing 1 as structure of a PTC component, in order to maintain low resistance, the structure where thickness of the PTC component 1 was set to about 30-100micro, and was covered with insulating resin 4 grade except for the lead takeoff connection of the metal lead 3, and PTC equipment A did not short-circuit the thickness of about 15-40micro and a metal plate 2 in it was taken. This PTC equipment A offered the configuration cell which used it for rechargeable batteries, such as primary cells, such as a lithium cell, a manganese dry battery, and an alkali manganese dry battery, and a nickel-cadmium battery, nickel hydrogen, a silver battery, and raised the safety as a power source.

[0003]

[Problem(s) to be Solved by the Invention] However, when PTC equipment A has the unusual energization from the outside, PTC equipment operates, the temperature of the PTC component 1 rises, the excessive current from the outside is removed and temperature returns to ordinary temperature, a thermal shock joins PTC equipment A. When this phenomenon was repeated, it was the thing it becomes impossible to maintain the safety of a cell by lack of insulating resin arising [a crack] to insulating resin 4 in being extreme, generating and, and PTC equipment A being in a short condition to it depending on conditions.

[0004] This invention solves such a technical problem and aims at raising environmental stress-proof nature, such as the thermal resistance of PTC equipment, and thermal shock resistance.

[0005]

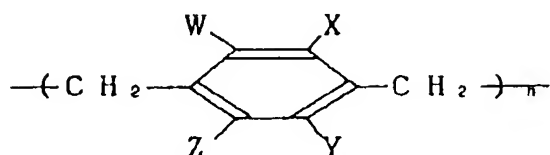
[Means for Solving the Problem] This invention is solved by using the poly PARAKI silylene system resin which is excellent in thermal resistance, thermal shock resistance, and mechanical physical properties as a resin coat of PTC equipment.

[0006]

[Function] Poly PARAKI silylene system resin has the chemical structure type shown in (** 1). From the conventional ABS plastics, this thing is excellent in thermal resistance, and has 2 to 3 times stronger physical properties also for mechanical strengths, such as abrasion resistance and impact nature. Therefore, the function of rear-spring-supporter PTC equipment is maintainable at a long period of time.

[0007]

[Formula 1]



W, X, Y, Z ; 置換基

[0008]

[Example] Next, the example of this invention is explained. It is the sectional view of the PTC equipment A which used poly PARAKI silylene system resin, drawing 1 (a) is the top view, (b) made polyethylene resin distribute the impalpable powder of conductors, such as carbon black and graphite, with a PTC component, and 1 carries out molding processing for it at the sheet whose thickness is dozens of micro. 2 is a metal plate which consists of nickel with a thickness of dozens of micro stuck to said PTC component by pressure, nickel alloy, Cu, and a Cu alloy. 3 is usually made of the same raw material as a metal plate 2 with the metal lead plate electrically connected to said metal plate 2. 4 is poly PARAKI silylene system resin by the insulating resin which coated the part except the lead takeoff connection of said metal lead plate.

[0009] Drawing 2 - drawing 4 are the front view of the lithium cell for cameras equipped with the PTC equipment A shown in drawing 1, a right side view, and a top view. In drawing, 5 is a cell receipt case. B is the diacid-ized manganese lithium cell of a cartridge, used two of these and has connected the cell by approaches, such as resistance welding and laser welding, electrically with PTC equipment A. 6 and 7 are the terminal holes of forward and a negative electrode established in the pars basilaris ossis occipitalis of a case 5. 8 is a lid which blockades up opening of a case 5, it is made of the same construction material as a case, and the junction unification of a lid and the case is carried out with ultrasonic welding or a binder. The incidence rate of the crack and omission of coating resin when a low temperature side carries out a thermal shock test to the temperature ambient atmosphere whose temperature by the side of -20 degrees C and an elevated temperature is 100 degrees C about what used conventional insulating resin about the PTC equipment of this invention constituted as mentioned above by making every 4 hours and a total of 8 hours into 1 cycle, respectively was compared. The result is shown in (a table 1). In addition, the number of test pieces was made into 500 pieces, respectively.

[0010]

[A table 1]

	1 0 c / s	5 0 c / s	1 2 0 c / s
本発明品 ポリパラキシレン系樹脂	0 %	0 %	0 %
比較品(1) シリコン樹脂	3.4 %	9.8 %	13 %
比較品(2) ウレタン樹脂	18 %	66 %	100 %

[0011]

[Effect of the Invention] As mentioned above, environmental stress-proof nature, such as the thermal resistance of PTC equipment and thermal shock resistance, is made as for what is depended on this invention to a very firm thing by using poly PARAKI silylene system resin for the raw material of insulating resin so that more clearly than (a table 1). For this reason, the dependability and the safety of PTC equipment and a configuration cell are maintainable over a long period of time.

[Translation done.]

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TECHNICAL FIELD

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PRIOR ART

[Description of the Prior Art] in the normal state, the PTC equipment which consists of the former by stick by pressure the metal plate which connected the metal lead to the PTC component (POSITIVE TEMPERATURE COEFFICIENT) which be an overcurrent and a heating protection component have the description which return to the original low resistor, when what be the resistor of dozens milli ohms become a dozens of ohms resistor by the unusual energization from the outside, and the temperature rise in the inside of a short time and an external load change into a normal condition. For this reason, as shown in drawing 1 as structure of a PTC component, in order to maintain low resistance, the structure where thickness of the PTC component 1 was set to about 30-100micro, and was covered with insulating resin 4 grade except for the lead takeoff connection of the metal lead 3, and PTC equipment A did not short-circuit the thickness of about 15-40micro and a metal plate 2 in it was taken. This PTC equipment A offered the configuration cell which used it for rechargeable batteries, such as primary cells, such as a lithium cell, a manganese dry battery, and an alkali manganese dry battery, and a nickel-cadmium battery, nickel hydrogen, a silver battery, and raised the safety as a power source.

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EFFECT OF THE INVENTION

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] However, when PTC equipment A has the unusual energization from the outside, PTC equipment operates, the temperature of the PTC component 1 rises, the excessive current from the outside is removed and temperature returns to ordinary temperature, a thermal shock joins PTC equipment A. When this phenomenon was repeated, it was the thing it becomes impossible to maintain the safety of a cell by lack of insulating resin arising [a crack] to insulating resin 4 in being extreme, generating and, and PTC equipment A being in a short condition to it depending on conditions. [0004] This invention solves such a technical problem and aims at raising environmental stress-proof nature, such as the thermal resistance of PTC equipment, and thermal shock resistance.

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MEANS

[Means for Solving the Problem] This invention is solved by using the poly PARAKI silylene system resin which is excellent in thermal resistance, thermal shock resistance, and mechanical physical properties as a resin coat of PTC equipment.

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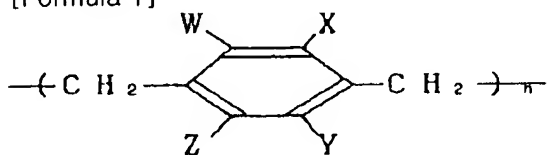
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OPERATION

[Function] Poly PARAKI silylene system resin has the chemical structure type shown in (** 1). From the conventional ABS plastics, this thing is excellent in thermal resistance, and has 2 to 3 times stronger physical properties also for mechanical strengths, such as abrasion resistance and impact nature. Therefore, the function of rear-spring-supporter PTC equipment is maintainable at a long period of time.
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EXAMPLE

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[0010]

[A table 1]

	1 0 c / s	5 0 c / s	1 2 0 c / s
本発明品 シリハキシレン系樹脂	0 %	0 %	0 %
比較品(1) シリコン樹脂	3 . 4 %	9 . 8 %	1 3 %
比較品(2) ウレタン樹脂	1 8 %	6 6 %	1 0 0 %

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] (a) The sectional view of the PTC equipment of this invention

(b) The top view

[Drawing 2] The front view of the configuration cell equipped with the PTC equipment of this invention

[Drawing 3] The right side view of the configuration cell equipped with the PTC equipment of this invention

[Drawing 4] The top view of the configuration cell equipped with the PTC equipment of this invention

[Description of Notations]

1 PTC Component

2 Metal Plate

3 Metal Lead

4 Insulating Resin (Poly PARAKI Silylene System Resin)

5 Cell Receipt Case

6 Seven Terminal hole

8 Lid

A PTC equipment

B Cell

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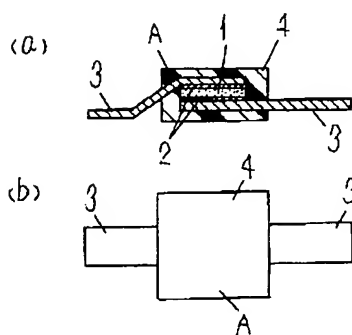
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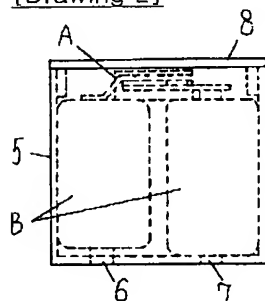
DRAWINGS

[Drawing 1]

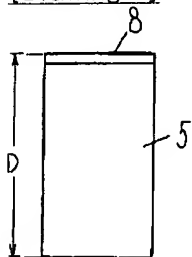
1---PTC素子
2---金属板
3---金属製リット
4---絶縁樹脂
A---PTC装置



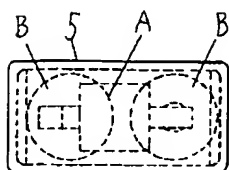
[Drawing 2]



[Drawing 3]



[Drawing 4]



[Translation done.]